the unusual circumstances relative to this comet, which have involved the computation of its elements in difficulties not often met with, and which induce him to request Dr. Wollaston to lay the method by which he proceeded before the Royal Society.

On the Electrical Phenomena exhibited in Vacuo. By Sir Humphry Davy, *Bart. P.R.S.* Read December 20, 1821. [*Phil. Trans.* 1822, *p.* 64.]

The relations of electricity to space, as nearly void of matter as it can be made on the earth's surface, are connected with many important queries bearing upon the nature of heat, light, electricity, and magnetism.

The vacuum used by Sir Humphry Davy was that above the mercury in the barometer tube, and a more perfect one produced in the same way by fused tin; the former he found always permeable to electricity, but the colour and intensity of the light in traversing the mercurial atmosphere was remarkably affected by its temperature; it became green and vivid when the tube was heated, and was scarcely perceptible in a very dark room, when it was cooled to 0°; which phenomena, as well as some others described by the author, are referable to the varying density of the mercurial vapour. The admission of a little air rendered the light blue, and improved the conducting power of the medium. The most perfect vacuum that could be obtained above fused tin, was also permeable to electricity; but the light was yellow and exceedingly pale, and only slightly increased by heat. Electric and magnetic repulsions and attractions took place in the mercurial vacuum, as in air;—a circumstance which shows, says Sir Humphry, that they are not dependent upon elastic ponderable matter, and point them out as primary causes of other electrical phenomena.

From the aggregate results of his researches, the author thinks it evident that the light, and probably the heat, generated in electrical experiments, depend principally upon some properties or substances belonging to the ponderable matter through which it passes, and they render it probable that it is entirely owing to this source.

Croonian Lecture. On the Anatomical Structure of the Eye; illustrated by Microscopical Drawings, executed by F. Bauer, *Esq. By Sir* Everard Home, *Bart. V.P.R.S.* Read November 15, 1821. [*Phil. Trans.* 1822, *p.* 76.]

Having ascertained, by the aid of Mr. Bauer's microscopical observations, that neither the marsupium nor the ciliary processes are muscular, and therefore inadequate to those adjustments of the crystalline lens requisite for distinct vision; and that the structure of the choroid coat is also membranous,—the author turned his attention to the structure of the iris, which in the human eye resembles that of the quadruped developed by Mr. Maunoir in his Treatise on the